CLAIMS

1. A method of dry treating a target surface prior to using the target for sputtering comprising:

a) preparing a target assembly and securing said target assembly in a vacuum chamber of a magnetron sputtering apparatus;

b) energizing the magnetic component of the magnetron sputtering apparatus with a power between about 0.2 kW and about 4 kW for a period of time between about 4 and about 30 minutes to produce a surface dry treatment of a sputtering ion plasma on an exposed surface of the target to effectively reduce inherently undesirable impurities on the surface; and

c) removing the treated target assembly from the magnetron sputtering apparatus.

2. The method of claim 1 wherein the magnetron sputtering apparatus is rotatable and the magnetic component of the magnetron sputtering apparatus is disposed on less than a 180° arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the surface of the target.

3. The method of claim 1 wherein the target surface is treated for a time period between about 8 and about 10 minutes and a power of between about 0.2 kW and about 0.4 kW.

4. The method of claim 4 wherein the target surface is treated as an inert atmosphere.

5. The method of claim 6 where the inert atmosphere is argon.

6. The method of claim 1 wherein after removing the target assembly from the magnetron sputtering apparatus in step c), at least the surface treated portion of the target assembly is placed in an enclosure to protect it during storage and shipment.

7. The method of claim 8 wherein the enclosure is metallic and the metallic enclosure containing the target assembly is further placed into a different enclosure.

8. The method of claim 1 wherein the target material selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, or alloys thereof.

9. The method of claim 2 wherein the magnetic component is FeNdB.

10. The method of claim 2 wherein the following step is added:

d) assembling the treated target assembly into a sputtering apparatus to coat the substrate and then sputtering the target and the burn-in time required is reduced by at least 10% using the treated target of step b) compared to an untreated target.

11. The method of claim 10 wherein the target surface is treated for a time period between about 8 and about 10 minutes and a power of between about 0.2 kW and about 0.4 kW.

12. The method of claim 11 wherein the target material selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, or alloys thereof.

13. A treated target assembly made by the method of claim 2.

14. The treated target assembly of claim 13 wherein the target surface is treated for a time period between about 8 and about 10 minutes and a power of between about 0.2 kW and about 0.4 kW.

15. The treated target assembly of claim 10 wherein the target material selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, or alloys thereof.

16. A magnetron sputtering apparatus comprising a vacuum chamber with a surface defining an opening adapted for securing a removable target assembly;

support structure surrounding the opening of the vacuum chamber and spaced outside of securing means for the removable target, a rotating magnet assembly secured to the support structure and disposed over the opening and adapted to be spaced apart from the removable target assembly, motor means for rotating the magnet assembly, and power means for energizing the magnet assembly.

17. The magnetron sputtering apparatus of claim 16 wherein the magnetic component of the magnetron sputtering apparatus is disposed on less than a 180° arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the surface of the target.

18. The magnetron sputtering apparatus of claim 17 wherein the magnet assembly contains a FeNdB magnet component.

19. The magnetron sputtering apparatus of claim 17 wherein the vacuum chamber comprising a bottom support plate, an upper support plate defining the opening and viton vacuum seal side enclosure.

20. The magnetron sputtering apparatus of claim 19 wherein a removable target assembly is secured into the opening in the upper support plate.